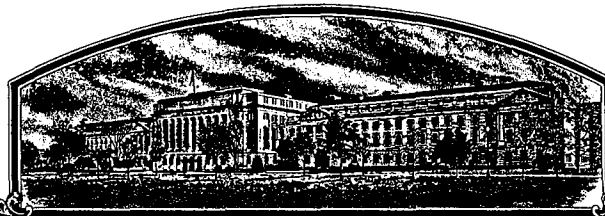


No.

8700045



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Northrup King Co.

Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (U.S.C. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'778'



In Testimony Whereof, I have hereunto set
my hand and caused the seal of the Plant
Variety Protection Office to be affixed
at the City of Washington, D. C.
this 30th day of June in
the year of our Lord one thousand nine
hundred and eighty-seven.

Attest

Kenneth H. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Richard E. Lyng
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)


1. NAME OF APPLICANT(S) Northrup King Co.		2. TEMPORARY DESIGNATION L8102		3. VARIETY NAME 778	
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) P.O. Box 959 Minneapolis, MN 55440		5. PHONE (Include area code) (612) 593-7333		FOR OFFICIAL USE ONLY PVPO NUMBER 8700045	
6. GENUS AND SPECIES NAME <u>Zea mays</u> L.		7. FAMILY NAME (Botanical) Gramineae		FILING DATE <u>January 9, 1987</u> TIME <u>10:00</u> <input checked="" type="checkbox"/> A.M. <input type="checkbox"/> P.M.	
8. KIND NAME Corn		9. DATE OF DETERMINATION May 1982		FEE RECEIVED AMOUNT FOR FILING \$ <u>1800.00</u> DATE <u>January 9, 1987</u> AMOUNT FOR CERTIFICATE \$ <u>200.00</u> DATE <u>May 26, 1987</u>	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation				12. DATE OF INCORPORATION 1896	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware				13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Robert W. Romig Northrup King Co. P.O. Box 959 Minneapolis, MN 55440 PHONE (Include area code): (612) 593-7305	
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED					
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)					
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.					
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)					
d. <input type="checkbox"/> Exhibit D, Additional Description of Variety.					
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership.					
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input checked="" type="checkbox"/> No					
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> Yes <input type="checkbox"/> No			17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> Foundation <input type="checkbox"/> Registered <input type="checkbox"/> Certified		
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> Yes (If "Yes," give date) <input checked="" type="checkbox"/> No					
19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? Hungary February 1986) Released as parent in hybrid <input checked="" type="checkbox"/> Yes (If "Yes," give names of countries and dates) Canada February 1986) U.S. February 1986 <input type="checkbox"/> No					
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF APPLICANT 				DATE January 5, 1987	
SIGNATURE OF APPLICANT				DATE 1	

EXHIBIT A

Origin and Breeding History of Corn 778

The inbred corn variety 778 is derived from a cross W117/B37 Ht which we made at our Research Station in Glen Haven, Wisconsin in the summer of 1971. The variety W117 is a public inbred line developed by the Wisconsin Agricultural Experiment Station and is derived from a cross 643/Minnesota 13. The variety B37 Ht is a Northrup King Co. derived version of the public inbred line B37. Line B37 is a public inbred corn line derived from the Iowa Stiff Stalk Synthetic and released by the Iowa Agricultural Experiment Station. Our line has a dominant, single gene resistance to race 1 of Helminthosporium turcicum, northern corn leaf blight.

Following the cross, we selfed the F₁ at our station at Waimea, Hawaii in the 1971-72 winter season. We then selfed individual plants in the F₂ population at Glen Haven, Wisconsin in the summer of 1972. We selected for early silking, stalk quality and good earing in this and in subsequent generations.

In 1974, we grew the F₃ of 778 as an ear-row family at our station in London, Ontario. We made random sib-crosses in this family which we planted in 1975 at London, Ontario. In 1975, we selfed individual plants in the progeny rows from 1974. In 1976, we further made sib-crosses within progeny rows. In 1977, we selfed and selected one ear each in selected progeny rows. In 1978, we again selfed plants in progeny rows and selected three ears from two rows.

In 1979, we made further selfings in each of the three progeny rows. We again selfed in the progeny rows in 1980 and in 1981. On the basis of test cross results in 1980, we selected six ears from one progeny row in 1981 which we planted in six progeny rows in 1982. On the basis of uniformity, we bulked selfed seed from row L140286-1 and assigned the station identification L8102 to the line.

In 1983, on the basis of further performance in test crosses, we assigned the company identification of 778 to L8102 and simultaneously produced breeder seed by hand pollination.

Variety 778 has been maintained since by bulk increases in isolation. The variety is uniform and stable. We have observed no variants during four years of increase.

Variety 778 was offered for sale in hybrids in February 1986.

EXHIBIT B**Novelty Statement for the Variety**

778 is most similar to the inbred line B37, a release from Iowa State University, Ames, Iowa. It can be differentiated from B37 by the following characteristics:

1. B37 has pink anthers; 778 has purple anthers.
2. B37 has dark to very dark green leaves; 778 has medium green leaves.
3. 778 reaches 50% silk approximately 150 heat units earlier than B37 from date of planting.

OBJECTIVE DESCRIPTION OF VARIETY
 CORN (ZEA MAYS)

NAME OF APPLICANT(S) Northrup King Co.	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) P.O. Box 959 Minneapolis, MN 55440	PVPO NUMBER <div style="font-size: 24pt; font-weight: bold; text-align: center;">8700045</div>
	VARIETY NAME OR TEMPORARY DESIGNATION <div style="text-align: center;">778</div>

Place the appropriate number that describes the varietal character of this variety in the boxes below.
 Place a zero in first box (e.g., 089 or 09) when number is either 99 or less or 9 or less.

1. TYPE:

2

1 = SWEET 2 = DENT 3 = FLINT 4 = FLOUR 5 = POP 6 = ORNAMENTAL

2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

2

1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST
 5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability):

(Under "comments" (pg. 3) state how heat units were calculated)

DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK

1 4 0 0

HEAT UNITS

DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY

HEAT UNITS

DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE

HEAT UNITS

4. PLANT:

1 6 0

CM. HEIGHT (To tassel tip)

0 5 0

CM. EAR HEIGHT (To base of top ear)

0 8

CM. LENGTH OF TOP EAR INTERNODE

Number of Tillers:

1

1 = NONE 2 = 1-2 3 = 2-3 4 = > 3

Number of Ears Per Stalk:

2

1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY
 3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

Cytoplasm Type:

1

1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = OTHER (Specify) _____

5. LEAF (Field Corn Inbred Examples Given):

Color:

2

1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DARK GREEN (B14) 4 = VERY DARK GREEN (K1)

Angle from Stalk (Upper half):

1

1 = < 30° 2 = 30-60° 3 = > 60°

Sheath Pubescence:

1

1 = LIGHT (W22) 2 = MEDIUM (WF9)
 3 = HEAVY (OH26)

Marginal Waves:

1

1 = NONE (HY) 2 = FEW (WF9) 3 = MANY (OH7L)

Longitudinal Creases:

2

1 = ABSENT (OH51) 2 = FEW (OH56A)
 3 = MANY (PA11)

Width:

0 7

CM. WIDEST POINT OF EAR NODE LEAF

Length:

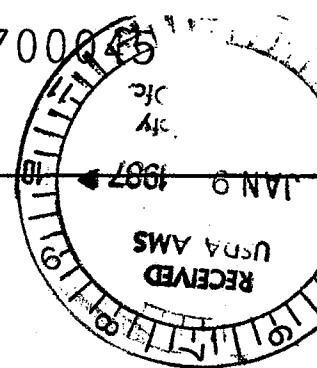
0 6 0

CM. EAR NODE LEAF

1 1

NUMBER OF LEAVES PER MATURE PLANT

8700045



6. TASSEL:

1 0

NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

2

1 = < 30°

2 = 30-40°

3 = > 45°

Penduncle Length:

3. 5

CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

2

1 = LIGHT (WF9)

2 = MEDIUM

3 = HEAVY (KY21)

4

Anther Color:

1 = YELLOW

2 = PINK

3 = RED

4 = PURPLE

5 = GREEN

5

Glume Color:

6 = OTHER (Specify) _____

Pollen Restoration for Cytoplasm (0 = Not Tested, 1 = Partial, 2 = Good)

0

"T"

0

"S"

0

"C"

0

OTHER (Specify Cytoplasm and degrees of restoration) _____

7. EAR (Husked Ear Data Except When Stated Otherwise):

1 4

CM LENGTH

4 0

MM. MID-POINT
DIAMETER

9 0

GM. WEIGHT

Kernel Rows:

2

1 = INDISTINCT

2 = DISTINCT

1 4

NUMBER

1

1 = STRAIGHT

2 = SLIGHTLY CURVED

3 = SPIRAL

Silk Color (Exposed at Silking Stage):

1

1 = GREEN

2 = PINK

3 = SALMON

4 = RED

Husk Color:

1

FRESH

1 = LIGHT GREEN

2 = DARK GREEN

3 = PINK

6

DRY

4 = RED

5 = PURPLE

6 = BUFF

Husk Extention: (Harvest Stage)

3

1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear)

3 = LONG (8-10CM Beyond Ear Tip)

4 = VERY LONG (> 10 CM)

Husk Leaf:

1

1 = SHORT (< 8 CM) 2 = MEDIUM (8-15 CM)

3 = LONG (> 15 CM)

Shank:

1 0

CM LONG

7

NO. OF INTERNODES

Position at Dry Husk Stage:

3

1 = UPRIGHT

2 = HORIZONTAL

3 = PENDENT

Taper:

1

1 = SLIGHT

2 = AVERAGE

3 = EXTREME

Drying Time (Unhusked Ear):

2

1 = SLOW

2 = AVERAGE

3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

1 0

MM LONG

0 9

MM. WIDE

0 5

MM. THICK

Shape Grade (% Rounds)

2

1 = < 20

2 = 20-40

3 = 40-60

4 = 60-80

5 = > 80

5

1

Pericarp Color:

1 = COLORLESS

2 = RED-WHITE CROWN

3 = TAN

4 = BRONZE

5 = BROWN

6 = LIGHT RED

7 = CHERRY RED

8 = VARIEGATED (Describe) _____

1

Aleurone Color:

1 = HOMOZYGOUS

2 = SEGREGATING (Describe) _____

1

1 = WHITE

2 = PINK

3 = TAN

4 = BROWN

5 = BRONZE

6 = RED

7 = PURPLE

8 = PALE PURPLE

9 = VARIEGATED (Describe) _____

2

Endosperm Color:

1 = WHITE

2 = PALE YELLOW

3 = YELLOW

4 = PINK-ORANGE

5 = WHITE CAP.

Endosperm Type:

3

1 = SWEET (su1)

2 = EXTRA SWEET (sh2)

3 = NORMAL STARCH

4 = HIGH AMYLOSE STARCH

5 = WAXY STARCH

6 = HIGH PROTEIN

7 = HIGH LYSINE

8 = OTHER (Specify) _____

3

0

GM. WEIGHT /100 SEEDS (Unsize Sample)

9. COB:

2

2

MM. DIAMETER AT MID-POINT

Strength:

2

1 = WEAK

2 = STRONG

Color:

2

1 = WHITE

2 = PINK

3 = RED

4 = BROWN

5 = VARIEGATED

6 OTHER (Specify) _____

10. DISEASE RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

1

STALK ROT (Diplodia)

1

STALK ROT (Fusarium)

1

STALK ROT (Gibberella)

1

NORTHERN LEAF BLIGHT

0

SOUTHERN LEAF BLIGHT

0

SMUT

0

SOUTHERN RUST

0

CORN SMUT

0

BACTERIAL WILT

0

BACTERIAL LEAF BLIGHT

0

MAIZE DWARF MOSAIC

0

STUNT

0

OTHER (Specify) _____

11. INSECT RESISTANT (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

1

CORNBORER

0

EARWORM

0

SAPBEETLE

0

APHID

0

ROOTWORM (Northern)

0

ROOTWORM (Western)

0

ROOTWORM (Southern)

0

OTHER (Specify) _____

12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity	A632	Kernel Type	B37
Plant Type	B37	Quality (Edible)	
Ear Type	W117	Usage	

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 - A System for the Classification of Corn Inbred Lines - PhD. Thesis, Ohio State University.

COMMENTS:

(Temp Maximum + Temp Minimum)/2 - 50 = Heat Units (Fahrenheit Temperature)

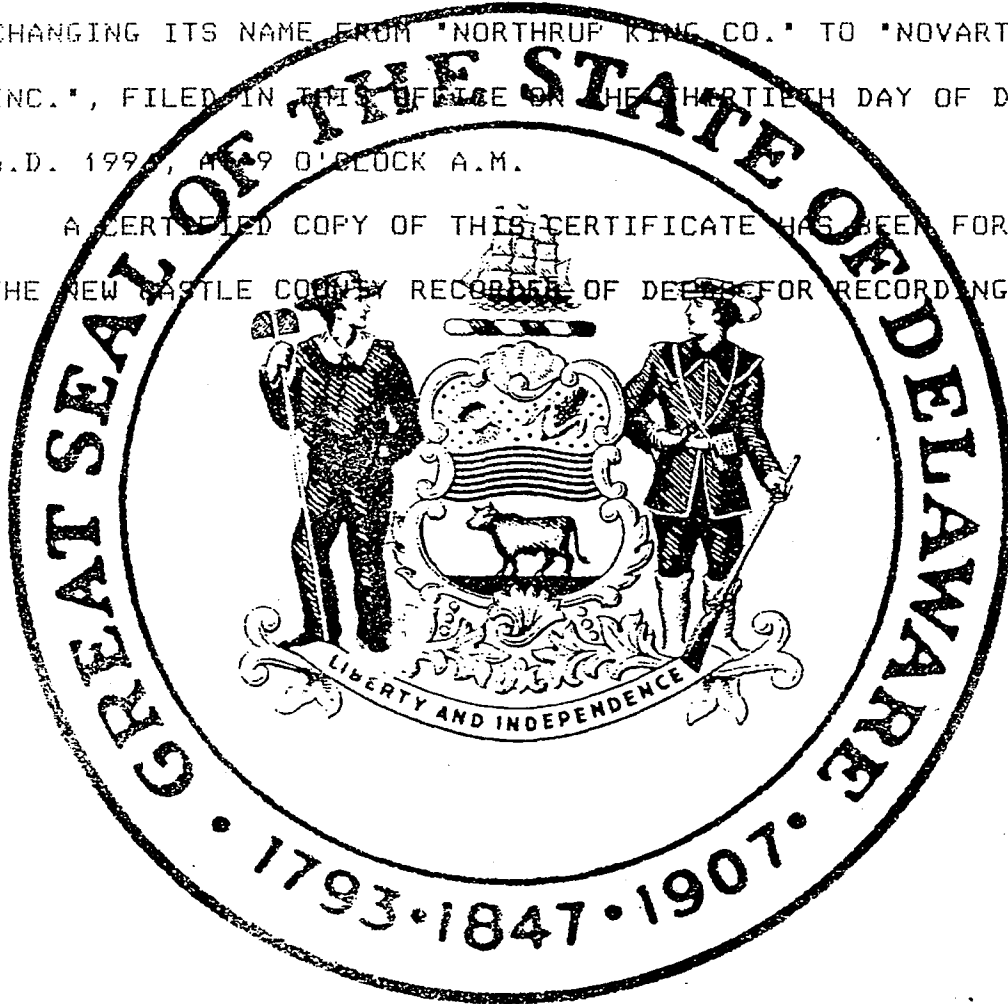
EXHIBIT E**Statement of the Basis of Applicant's Ownership**

The inbred line 778 was developed by Northrup King Co. corn breeding staff from germplasm cited in Exhibit A of the application. Northrup King Co. believes this inbred line is novel as defined in the Plant Variety Protection Act, and therefore that Northrup King Co. is the sole owner of the variety.

Office of the Secretary of State

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "NORTHROP KING CO.", CHANGING ITS NAME FROM "NORTHROP KING CO." TO "NOVARTIS SEEDS, INC.", FILED IN THIS OFFICE ON THE THIRTIETH DAY OF DECEMBER, A.D. 1996, AT 9 O'CLOCK A.M.

A CERTIFIED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDS OF DEEDS FOR RECORDING.



Edward J. Freel, Secretary of State

0829320 8100

960389892

AUTHENTICATION:

8267947

DATE:

12-31-96

CERTIFICATE OF AMENDMENT OF CERTIFICATE OF INCORPORATION
OF
NORTHROP KING CO.

It is certified that:

1. The name of the corporation (hereinafter called the "Corporation") is Northrup King Co.

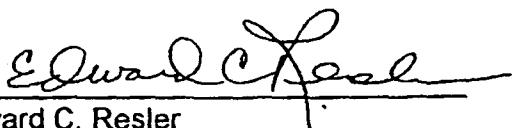
2. The Certificate of Incorporation of the Corporation is hereby amended by striking out Section 1 thereof and by substituting in lieu of said Section the following new Section.

1. The name of the Corporation is Novartis Seeds, Inc.

3. The amendment of the certificate of incorporation herein certified has been duly adopted and written consent has been given in accordance with the provisions of Sections 228 and 242 of the General Corporation Law of the State of Delaware.

4. The effective date of the amendment herein certified shall be January 1, 1997.

Signed on December 27, 1996.


Edward C. Resler
Vice President & Secretary